REPORT TO CONGRESS

ON

MATTERS CONTAINED IN THE HELIUM ACT

(PUBLIC LAW 104-273)

FISCAL YEAR 1997

BY

THE SECRETARY OF THE INTERIOR

JANUARY 1998

TABLES

EXECUTIVE BRIEF

Bureau of Land Management (BLM) helium sales to Federal agencies and their contractors were 216 million cubic feet (MMcf)[1] in fiscal year (FY) 1997. Revenues from helium sales, services, and other sources were $24.3 million which exceeded the $15.8 million funded cost of operations. A payment of $8.0 million was made to the Treasury for application to the Helium Fund debt.

As of September 30, 1997, the Government had $420.2 million in helium program assets. Current liabilities were $3.2 million (accounts payable and customer advances), and long-term debt to the U.S. Treasury decreased $8.0 million to $1.3572 billion leaving a negative net worth of $936.2 million.

At the end of FY 1997, there were 35.5 billion cubic feet (Bcf) of helium stored in the Cliffside helium storage reservoir. Of this volume, 30.9 Bcf is owned by the Government and 4.6 Bcf by private industry. Estimates of helium demand made in 1992 by Federal agencies for the period 1997-2015 totaled 9.8 Bcf. Thus, the Government's current helium reserve is adequate to meet their estimated demand through this period.

Operation of the Government's helium conservation pipeline and storage system averted disruptions in the commercial market as private sector companies used the pipeline and storage system to satisfy their helium needs. In FY 1997, the BLM stored 1,335 MMcf and returned 752 MMcf of privately owned helium through the pipeline.

[1]All volumes in this report are at 14.7 pounds per square inch absolute and 70 ^{o}F

1. Nature and Scope of Report

This report complies with Section 16 of the Helium Act, 50 U.S.C., Section 167 et seq., as amended by the Helium Privatization Act of 1996 (Public Law 104-273) advising Congress of the status of the Government's helium program. It contains operating, statistical, and financial information about the program for the fiscal year ending September 30, 1997.

2. General Status of the Government's Helium Program

In September 1996, Congress passed the Helium Privatization Act of 1996 which directs the Department of the Interior to cease refining helium and to begin the process of liquidating crude helium reserves over the next 20 years.

The Federal Helium Program is conducted by the BLM for the Secretary of the Interior under 50 U.S.C. 167, et seq., which provides for the current and foreseeable future helium requirements of essential Government activities. The program includes the production, conservation, sale, and distribution of helium; helium resources evaluation; and Federal helium resources disposition as follows:

a. Meeting the current helium demand of all Federal agencies. This includes operation, utilization, and maintenance of helium plants and shipping containers (high-pressure cylinders, semitrailers, railway tank cars, liquid helium dewars, and liquid helium semitrailers) for the production and distribution of helium to those agencies.

b. Providing, for the foreseeable future, helium requirements of essential Government programs. This includes operation, utilization, and maintenance of natural gas and helium storage fields and gas gathering, metering, transportation, and injection well systems for the conservation and storage of helium and helium-gas mixtures.

c. Conducting investigations and evaluations for improving all aspects of the helium program. This includes the development of more efficient methods for producing, distributing, conserving, and storing helium and the improvement of techniques for locating natural gas fields and evaluating their helium content for inclusion in the U.S. helium resource base.

d. Conducting research to identify private leaseholds that have extracted and processed Federal helium from natural gas. This includes entering into contracts with leaseholders to collect revenues due the Federal Government.

The BLM carries out these functions through the Helium Program Administrator in Washington, D.C., and the General Manager--Helium Operations in Amarillo, Texas. The BLM owns two helium plants, the Cliffside Federal helium storage reservoir, and related pipelines in Texas, Oklahoma, and Kansas.

The emphasis of the BLM's helium program is on production, distribution, and

conservation of helium for essential Government needs. Historically, the U.S. Bureau of Mines managed the Helium Conservation program to provide users with the assured quantity

and quality of helium. The BLM sold 216 MMcf[1] of helium in FY 1997, almost all of which was purchased by Federal agencies or their contractors. Sales were made directly from the BLM to the various customers or through contract distributors under contracts described in the Code of Federal Regulations (30 CFR 602).

As of September 30, 1997, the Government had $420.2 million in helium program assets (see Table 7, page 10). As of September 30, 1997, liabilities were $3.2 million (accounts payable and advances) and long-term debt to the U.S. Treasury was $1,357.2 million leaving a negative net worth of $936.2 million.

3. Reviews and Reports

Statutory Reassessment

On October 9, 1996, President Clinton signed the Helium Privatization Act of 1996 (Public Law 104-273). This legislation directs Helium Operations to discontinue production and sale of refined helium by no later than 18 months from the date of enactment (by April 9, 1998). Key components of the legislation are as follows:

a. Cease production and sales of grade-A[2] helium on or before April 9, 1998, allowing customers to purchase helium from private industry. Status: Dewar sales of liquid helium ceased on October 1, 1997; preparation of special analyzed cylinders ceased on November 1, 1997; effective January 1, 1998, all liquid trailer filling ceased; and on April 4, 1998, Helium Operations will decommission its Exell Helium Plant.

b. Dispose of all helium production, refining, and sales-related assets not later than 24 months after helium refinery closing. Status: Preliminary studies such as 106 Historical Review, Phase 1 Environmental Site Assessment, and property disposal actions are underway.

c. Begin selling Federal crude helium reserves in excess of 600 MMcf on or before January 1, 2005, and complete sales by January 1, 2015. Sale of crude helium is contingent on a legislatively mandated study by the National Academy of Sciences concerning the impact of selling Federal helium reserves on national scientific and military interests. Status: National Academy of Sciences study is underway.

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[1]All volumes in this report are at 14.7 pounds per square inch absolute and 70 °F.

[2]Helium purity of at least 99.995 percent.

d. Continue operation of the helium storage system which includes the storage field and crude helium pipeline that is utilized for storage and distribution of both Government-owned and privately owned crude helium.

e. Continue collection of helium royalties and fees from sales of helium extracted from gas produced from Federal lands.

f. Continue helium resource evaluation and reserve tracking to monitor helium availability for essential Government programs.

g. Complete land transfer to Girl Scout Council. Status: A legislatively mandated transfer of the tract of land (known as the Landis property) to the Texas Plains Girl Scout Council is pending. A baseline human and environmental risk assessment for a 331-acre tract of land owned by Helium Operations was sent to the Texas Natural Resources Conservation Commission. The assessment is required to officially close two old landfills on the property before transfer of ownership of the tract can be completed.

4. Conservation

As part of its conservation responsibility, the BLM maintains the Cliffside helium storage reservoir, associated pipelines, and measuring and monitoring services. In the mid-1970s, Helium Operations began accepting privately owned crude helium for storage in the Cliffside reservoir under long-term contracts. Private industry currently has, in storage, more than an 18-month supply of helium at the world's current estimated consumption rate. Current helium storage contracts generate sufficient revenue to offset the cost of maintaining private helium in storage.

As of September 30, 1997, 35,468 MMcf of helium was in underground storage in the Cliffside helium reservoir near Amarillo, Texas. Of this, 30,852 MMcf was Government owned and 4,616 MMcf was privately owned. In addition, there was 3,605 MMcf of helium contained in producible native natural gas in the reservoir. Therefore, the Cliffside storage reservoir contained about 39,073 MMcf of helium. During the year, 1,335 MMcf was accepted for private industry storage, and 752 MMcf was redelivered to its owners for a net annual increase in private storage of 583 MMcf of helium.

The BLM purified 216 MMcf of grade-A helium from previously stored Federal crude helium in FY 1997. Approximately of that total, 99 percent was supplied to Federal agencies or their contractors.

5. Supply and Demand

Natural gas containing about 0.3 percent (3,000 parts per million) or more helium continues to be the only economical source of helium in the United States. The BLM conducts a continuous gas sampling survey to identify new helium-bearing natural gas fields and to appraise and evaluate proven helium reserves and probable resources throughout the United States

The BLM estimates the measured and indicated helium resources in helium-rich[3] natural gas in the United States as of January 1, 1997, to be 221 billion cubic feet (Bcf).[4] Of this volume, about 85 Bcf is in gas found in reservoirs that are not being produced. Such helium resources are classified as nondepleting. The 221 Bcf in the helium-rich gas plus the 35 Bcf of Government and private helium in storage provides the United States with 256 Bcf of helium resources.

The Federal Government owns approximately 162 Bcf, or 63.3 percent, of the 256 Bcf of the stored and helium-rich measured and indicated helium resources in the United States. This includes 31 Bcf in storage, 4 Bcf in Cliffside field native natural gas, and 73 and 59 Bcf, respectively, in depleting and nondepleting natural gas resources on Federal lands. Revenue collected during fiscal year 1997 for helium extracted from Federal lands by private leaseholds was over $3.6 million.

In 1992, Helium Operations obtained estimates of the helium needs through the year 2015 of the six major helium-using agencies (National Aeronautics and Space Administration, Department of Defense, Department of Energy, National Oceanic and Atmospheric Administration, National Institute of Standards and Technology, and National Science Foundation). The total demand estimated for the period 1997-2015 is 9.8 Bcf. Therefore, the Government's helium supply of 30.9 Bcf in Cliffside is adequate to supply the Federal agencies' demand for this period.

The total market for U.S.-produced helium increased to 3,439 MMcf in FY 1997 compared to 3,369 MMcf in FY 1996. The BLM supplied about 6 percent of the domestic market, and private industry supplied 94 percent. Table 1 shows the total market for U.S.-produced helium from FY 1988 through FY 1997 including exports. In 1997, private industry exported 986 MMcf of helium.

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[3]Natural gas containing 0.30 percent or more of helium.

[4]Where appropriate, volumes in this report have been rounded to the nearest billion cubic feet.

TABLE 1. - Market Demand for U.S.-Produced Helium
(Million cubic feet)

Fiscal Year	Volume	Fiscal Year	Volume
1988	2420	1993	3,313
1989	2,688	1994	3,389
1990	2,984	1995	3,434
1991	3,123	1996	3,369
1992	3,314	1997	3,439

6. Production

Since 1981, all Federal helium demand has been supplied by grade-A helium production from the BLM's Exell Helium Plant in Texas. The Exell plant produces grade-A helium from Government-owned crude helium and processes a small volume of Cliffside native gas for plant energy requirements and helium recovery. In view of the pending refinery closure, major project work at the helium facilities during FY 1997 was limited to work required to maintain operation and capital investment with a short payback period. Some of the work done to enable Helium Operations to continue to supply helium was as follows: replacement of specialized equipment which failed due to normal cyclical wear and tear; addition of a separate gas flare for waste CO_2 stream; replacement of loose and exposed asbestos insulation on the plant's process equipment; regrout of nitrogen compressor engines and acoustic emission; and ultrasonic testing (AE/UT) of 7 gaseous helium trailers, 14 gaseous helium tank cars, and 13 modular assemblies. During FY 1997, commercial trailer-filling responsibilities were transferred from the Exell Helium Plant to the Amarillo Helium Plant.

Table 2 shows BLM production for FY 1988 through FY 1997.

TABLE 2. - Bureau of Land Management Helium Production*
(Million cubic feet)

Fiscal Year	Volume	Fiscal Year	Volume
1988	327	1993	321
1989	352	1994	270
1990	401	1995	248
1991	370	1996	228
1992	341	1997	216

*Grade-A production from previously purchased BLM crude helium plus contract purification of privately owned and stored crude helium for private markets. In FY 1997, BLM production for Federal agencies and a few private industry accounts was 216 MMcf.

7. Sales and Distribution

Sales to Federal agencies, Federal agency contractors, and a few private industry customers totaled 216 MMcf in FY 1997. Table 3 shows BLM sales for FY 1988 through FY 1997. Reduced spending for defense, nuclear research, and space activities has contributed to the decrease in Federal helium sales.

Distribution of BLM helium to the Federal market requires a large number of Government-owned containers for shipping gaseous or liquid helium. Gaseous helium shipping containers include high-pressure cylinders, automotive semitrailers, and railway tank cars. Low-pressure liquid helium shipping containers include 100- and 500-liter dewars
and bulk liquid helium semitrailers. Because these containers are used in interstate commerce, they must be maintained and tested according to Department of Transportation regulations.

Tank car maintenance and AE/UT are provided at the Exell Helium Plant. High-pressure cylinders used for high-purity helium and special analytical purposes are maintained and hydrostatically tested at the Amarillo Helium Plant. Maintenance of gaseous semitrailers and dewars is performed at both plants. In 1997, the BLM filled and shipped 277 railway tank cars, 827 automotive semitrailers, 2,663 liquid helium dewars, 16 liquid helium automotive semitrailers, 1,071 cylinders, and 14 modules. Helium Operations will cease dewar filling operations on October 1, 1997, and liquid trailer-filling operations on January 1, 1998.

TABLE 3. - Volume of Bureau of Land Management Helium Sales
(Million cubic feet)

Fiscal Year	To Private Industry	To Federal Agencies*	Total
1988	1	317	318
1989	1	343	344
1990	1	392	393
1991	1	349	350
1992	1	325	326
1993	1	292	293
1994	1	248	249
1995	1	244	245
1996	0.40	228	228
1997	0.04	216	216

*Includes sales made through private helium distribution contractors under 30 CFR 602.

8. Technical Studies and Evaluations

The Technical and Analytical Services Laboratory provided technical and analytical services to Federal agencies, Federal agency contractors, and private industry; to universities with specialized gas mixture requirements and calibration mixtures; and to local conservation, production, process, and environmental operations.

The laboratory developed a procedure to treat waste generated at the Exell Helium Plant. The procedure involved converting water-soluble reclaimer wastes bearing chromium into an inert solid which meets the requirements found in 40CFR 270.1(2)(vii) and 30TAC 335.41(d)(3). To determine the effectiveness of the waste treatment procedure, an analytical method for analyzing chromium in amine glycol solution was developed. Conventional chemical analysis of the solution is difficult because of its water-soluble organic compound content, alkalinity, viscosity, and solids content. The waste treatment procedure and analytical method proved successful when over 2,000 gallons of chromium-bearing waste from the Exell Plant were treated and converted into 60 tons of solids that are environmentally compliant for disposal under the Resources Conservation and Recovery Act. By developing a solution to plant-generated waste, Helium Operations saved over $500,000 in conventional treatment and environmental cleanup cost. The BLM publication, *Technical Note 400*, describes the analytical method used.

The laboratory purchased a new magnetic sector mass spectrometer to replace the old and unrepairable mass spectrometers that are too large to move to the Cliffside facility.

9. Helium Program Expenditures, Income, and Financial Condition

As of September 30, 1997, the Federal Government had $420.2 million in helium program assets of which $365.1 million was invested in helium stored for future use (conservation program crude helium purchases); $9.8 million in helium plants, gasfields, pipelines, and transportation equipment; and $45.3 million in current assets. Program income during
FY 1997 was $24.3 million. Funded cost of operations was $15.8 million.

The Helium Privatization Act of 1996 stipulated that no more interest would accrue on the helium debt, and, as of September 30, 1995, that debt stood at $1,373.2 million. Repayment of $8.0 million in FY 1996 and FY 1997 reduced the debt to $1,357.2 million. Net worth in FY 1997 was a negative $936.2.

Table 4 shows the status of the indebtedness as of September 30, 1997. Table 5 outlines the helium program's cash flow during FY 1997.

TABLE 4. - Status of Indebtedness of Helium Fund, September 30, 1997

Indebtedness to U.S. Treasury, September 30, 1996	$1,365,203,782
Interest accrued on indebtedness during FY 1997	0
Total indebtedness prior to repayments	$1,365,203,782
Repayments to U.S. Treasury during FY 1997	8,000,000
Indebtedness to U.S. Treasury, September 30, 1997	$1,357,203,782

TABLE 5. - Helium Program Cash Flow, Fiscal Year 1997*

Cash on hand September 30, 1996	$35,853,704
Cash received during 1997	23,514,790
Cash available in 1997	59,368,494
Cash disbursements in 1997	23,316,973
Cash on hand September 30, 1997	36,051,521

*Cash receipts and disbursements may contain entries from prior fiscal years. Totals could vary from revenues earned or obligations paid during the fiscal year.

Table 6 shows the total funds required and funds available in FY 1997 on an accrued expense and income basis. Table 7 summarizes the assets, liabilities, and net worth of the Helium Fund as of September 30, 1997.

TABLE 6. - Helium Fund Statement, Fiscal Year 1997

ACCOUNTS PAYABLE, SEPTEMBER 30, 1996	$1,910,441	
FUNDS REQUIRED, FY 1997: *		
Nonexpendable transfers	8,000,000	
Conservation and storage of helium	1,349,609	
Production and sales of helium	12,724,990	
Administration and other expenses	1,736,888	
Capital investment	11,903	
Subtotal		25,733,831
FUNDS AVAILABLE FROM OPERATIONS:		
Income from helium sales, services, and other sources		
Net revenue, FY 1997	$24,286,134	

Accounts receivable, start of year	$1,988,342		
Less: Accounts receivable and advances, end of year	(2,790,237)		
Net		(801,895)	
Cash on hand, start of year	35,853,704		
Less: Cash on hand, end of year	(36,051,521)		
Net		(197,817)	
Advances		63,323	
Net changes in other assets		743,072	
Subtotal			24,092,817
ACCOUNTS PAYABLE, SEPTEMBER 30, 1997			1,641,014

*Funds required are shown on a cash outlay basis and differ slightly from budget numbers which are based on obligations.

TABLE 7. - Helium Program Financial Condition, September 30, 1997

CURRENT ASSETS:		**LIABILITIES**:	
Cash	$36,051,521	Accounts payable	$1,641,013
Accounts receivable	2,790,237	Advances	1,287,293
Advances	0	Unfunded liability	0
Inventory and work in process	6,499,028	Long term debt to U.S. Treasury	1,357,203,782
Total current assets	45,340,786	*Total liabilities*	1,360,132,088
FIXED ASSETS:		**NET WORTH**:	
Helium in underground storage	365,064,632	Donations and transfers*	46,911,210
Plants, property, and equipment (net)	9,769,536	Retained earnings** (deficit)	(986,868,344)
Total fixed assets	374,834,168	*Total net worth*	(939,957,134)
TOTAL Assets	420,174,954	**TOTAL Liabilities & Net Worth**	420,174,954

* Donations and transfers represent an accumulation of donated and transferred capital items primarily from other Government agencies. These include property and equipment transfers since the beginning of the Helium Program.

** Retained earnings are an accumulation of net revenue and expenses over the life of the Helium Program. This deficit (retained earnings) is a result of several years of cumulative operating losses attributed entirely to the accrual of long-term interest payable to Treasury.